

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-8 and 10-19 will be pending in the application subsequent to entry of this Amendment. The issues raised in the outstanding Official Action will be addressed in the order presented.

Information Disclosure Statement

The Information Disclosure Statement of May 2, 2007 was based upon the understanding that copies of the relevant documents cited in the International Search Report were or would be furnished by the International Bureau. In the event this proved not to be the case, so submitted concurrently herewith is a further Information Disclosure Statement, including payment of relevant fee, submitting copies of these documents with the request that they be considered during further examination of this application.

Specification

The spelling of "Dor" in the title of the application has been corrected.

Discussion of Amendments to the Claims/Response to Claim Objections

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and direct them to preferred aspects of the disclosure.

Each of the independent claims is amended and directed to the presence/use of a "carbohydrate polymer comprising aldehyde containing monomer unite, whereby at least 1 % of the aldehyde containing monomer units comprise one aldehyde group per monomer unit which aldehyde group is derived from a primary alcohol group".

The cited prior art does not disclose products or processes wherein at least 1 % of the aldehyde containing monomer units comprise one aldehyde group per monomer unit.

Reference to synthetic polymers has also been deleted from all pending claims.

The improper multiple dependencies in claims 5-7 have been removed and claim 9 has been cancelled.

A typo/spelling error "thermoplastic" n claim 13 (first line) was corrected.

Claim 15 has been rephrased such that it is clear that it is a granulate of thermoplastic starch according to claim 12.

Claims 17 and 18 are added and basis for these new claims is found in original claim 15 (dependent on 13 and 14 respectively)

Claim 19 was added directed to a process according to claim 1, in which the thermo mechanical treatment is an extrusion. Basis is, e.g., found at page 1, line 12, of the international application as published.

Claims 2-9 and 12-16 have been amended accordingly, in view of the amendments to claim 1.

It is respectfully submitted that the claims as presented and amended above are fully compliant with 35 USC §112, first and second paragraphs, and are in proper formal order. Reconsideration is requested.

Response to Claim Rejection Under 35 USC §112, Second Paragraph

The examiner will note that claim 9 has been canceled thus rendering this rejection moot.

Response to Prior Art-Based Rejections

The Official Action includes a series of prior art-based rejections based primarily upon commonly-assigned, published U.S. application of Fischer 2007/0006875, which is applied only as an anticipation to selected claims, while the remaining rejections relate primarily to and are based upon U.S. patent 6,313,105 to Bengs et al, either taken by itself or in view of secondary references. Counsel notes that quite appropriately the Fischer et al published U.S. application is not applied under 35 USC §103(e).

The cited prior art does not disclose products or processes wherein at least 1 % of the aldehyde containing monomer units comprise one aldehyde group per monomer unit.

Bengs et al is directed at the use of dialdehyde starches, thus the subject matter of the present claims is distinguished from Bengs et al in that Bengs et al does not disclose products or processes wherein at least 1 % of the aldehyde containing monomer units comprise one aldehyde group per monomer unit.

The subject-matter of claim 1 is distinguished over Bengs et al (or Fischer et al) in that the carbohydrate has at least 1 % of the aldehyde containing monomer units comprising one aldehyde group per monomer unit which aldehyde group is derived from a primary alcohol group.

As indicated in the present application (*see* page 2, line 9 to page 3, line 2 of the International application), the process of the invention is advantageous over a process wherein a dialdehyde starch (DAS) is used as is the case in Bengs et al.

In particular, the presence of aldehyde containing monomer units comprising one aldehyde group per monomer has a beneficial effect on the processing of the starch. Even small amounts of such carbohydrate polymers or synthetic polymers comprising one or more of such aldehyde groups allow for a considerable lowering of the thermo mechanical treatment temperature and the capacity of the device wherein thermo mechanical treatment is carried out.

This is also illustrated in Example 1; *see* in particular page 14, lines 4-8 where it is indicated that when a C-6 aldehyde starch is added (the carbohydrate polymer wherein at least 1 % of the aldehyde containing monomer units comprise one aldehyde group per monomer, which aldehyde group is derived from a primary alcohol group), an increase in force (as an indication for gelatinization) was achieved at a lower product temperature (processing temperature) than when DAS was used, which shows a higher reaction efficiency of the C6-aldehyde starch having less aldehyde groups present per 100 glucose units than with DAS-20.

Thus, the use of a carbohydrate polymer, as defined in amended claim 1, offers a technical advantage over the use of DAS, in that nearly complete gelatinization is realized in a more efficient manner and/or at a lower temperature.

There is no suggestion found in the cited prior art that the use of a carbohydrate polymer as defined in present claim 1 would offer an advantage, let alone a beneficial effect on the processing of the starch, such as the possibility to achieve complete gelatinization at a lower temperature. Accordingly, the subject-matter of claim 1 involves an inventive step over Bengs et al.

For completeness sake, it is observed that one or more further advantages may be provided in accordance with the invention, which further contribute to non-obviousness.

In particular, it has been found that in order to reach a specific tensile strength a lower amount of a carbohydrate polymer suffices if a carbohydrate polymer containing monomeric units with one aldehyde group, which aldehyde group is derived from a primary alcohol group, is used, compared to a DAS. This allows one to obtain a product with a higher tensile strength at the same aldehyde group containing carbohydrate polymer concentration or the same tensile

strength at a lower concentration. A lower concentration may in particular be advantageous with respect to improved dimension stability in water.

Jetten et al do not disclosed the presence/use of a "carbohydrate polymer comprising aldehyde containing monomer units, whereby at least 1 % of the aldehyde containing monomer units comprise one aldehyde group per monomer unit," let alone that this would offer any of the advantages mentioned above.

The same observations apply to the product claims – none of the cited prior art suggests to provide a product, as defined in any of the product claims, comprising a carbohydrate polymer that comprises aldehyde containing monomer units, whereby at least 1% of the aldehyde containing monomer units comprise one aldehyde group per monomer unit which aldehyde group is derived from a primary alcohol group. For these reasons, the subject matter of these claims is not obvious over the cited prior art.

Moreover, as indicated above, the presence of such carbohydrate polymer may be beneficial with respect to dimensional stability in water and/or tensile strength. These surprising technical effects further add to the presence of nonobviousness.

Response to Obviousness-Type Double Patenting

Claims 1, 3, 4 and 9-14 are, according to the examiner's view, not patentably distinct from certain claims (*see* page 9, first paragraph, under the heading "Double Patenting" and compare with the last two lines on page 10) over U.S. patent 7,255,732.

Applicants submit that the now-pending claims are patentably distinct from all of the claims contained in commonly assigned patent 7,255,732 and thus applicants request reconsideration of this rejection.

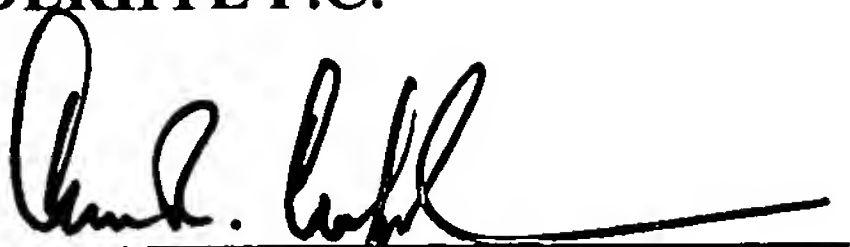
For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration and allowance are solicited. Should the examiner require further information, please contact the undersigned.

THORTON et al.
Appl. No. 10/594,121
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Respectfully submitted,

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